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# Nutritional Sciences

## Congratulations!



NSC graduate student **Adam Lyon** recently visited Boston, MA to participate in the Graduate Student Research Awards Competition at the Experimental Biology Conference. Along with two other winners, Adam placed first in a competition that involved graduate students from all over the United States and Canada. Adam explained that his presentation, *Epigenetic Regulation of the FXR by High Fat Diet and APC in Colon Cells*, “shows that functional APC (adenomatous polyposis Coli) is required for a normal response to high fat diet by farnesoid X receptor (FXR). FXR is known as the ‘master regulator of bile acid homeostasis’ and protects against colon cancer by reabsorbing bile acids that are secreted into the small intestine to aid in dietary fat absorption. APC is a tumor suppressor typically lost early in the development of colon cancer. Its expression has been associated with the expression of FXR, which led us to look for an epigenetic mechanism of control between APC and FXR.”

Adam analyzed the expression of FXR and other genes in the colons of mice; some that were fed a high fat diet and others that had an APC deficiency. “We showed that a high fat diet and loss of APC act on FXR expression through the epigenetic mechanism of promoter methylation. This suggests that people who lose APC and are on a high fat diet are at greater risk of developing colon cancer because they lose FXR expression and may not be able to reabsorb bile acids as efficiently. Bile acids that are not reabsorbed are modified into secondary bile acids that induce inflammation and colon cancer”. Explaining this research is challenging, and Adam was nervous going up against graduate students from places like Tufts, University of Illinois Urbana-Champaign, and Penn State. “I practiced over and over, each time doing a little better. I was happy and relieved to have my best presentation during the real thing.”

This work was conducted in the laboratory of Drs. Donato Romagnolo (research advisor) and Ornella Selmin, faculty in the Department of Nutritional Sciences, and supported by a University of Arizona Cancer Center Support Grant to Dr. Romagnolo and Dr. Peter Lance, a Cancer Center co-investigator on the study. Other collaborators in the project included Drs. Changming Fang and Jeffrey Smith from Sanford-Burnham Medical Research Institute, La Jolla, CA, who provided tumor tissues from APC deficient mice; Dr. Jesse Martinez who collaborated on the high fat diet studies; and Drs. Patricia Thompson and Tom Doetschman at The University of Arizona Cancer Center.

Adam plans to continue working in Dr. Romagnolo’s lab this summer to finish the research associated with this award before graduating in August. He then intends to gain some work experience before applying to a PhD program. “I’m looking for jobs right now in the biotechnology/pharmaceutical industry. I will be able to use what I’ve learned and apply it to future projects. This project may help us identify people who are at greater risk for colon cancer, especially if they consume a high fat diet. The big picture is cancer prevention. I hope I get to work in cancer prevention in the future.”

## UA Student Selected for Top AND Award in AZ

NSC senior **Sarah Alsing** was selected for the Outstanding DPD Student Award for the state by the Arizona Academy of Nutrition and Dietetics (AND). After graduating this May, Sarah will move to Los Angeles, California to begin a dietetic internship at the VA Greater Los Angeles Healthcare System. *Congratulations Sarah!*



# Research

## Research Highlight: Drs. Donato Romagnolo & Ornella Selmin



The vast majority of endocrine tumors in women are not linked to family history. This raises the question of whether or not alterations of endocrine pathways by environmental and dietary factors contribute to the development of these types of tumors and the role of molecular mechanisms. The term *epigenetics* refers to reversible changes in gene expression related to modifications in DNA methylation, histone posttranslational modifications, chromatin remodeling factors, and non-coding RNAs. The sum of epigenetic changes that contribute to cancer development is defined as the “cancer epigenome”. Understanding which epigenetic changes precede and/or accompany the transition of a cell from normal to cancerous may provide new targets for prevention and treatment.

Drs. Romagnolo and Selmin, faculty in the Department of Nutritional Sciences, share a laboratory at The UA Cancer Center. Recently, they received grants from the US Department of Defense Breast Cancer Research Program, the Arizona Biomedical Research Commission, and the Soy Health Research Program to study how production of a protein called BRCA-1 is lost in breast tissue and the modifying effects of dietary compounds. Loss of BRCA-1 is highly correlated with the development of breast cancer. Drs. Romagnolo and Selmin hope to identify the epigenetic changes that ensue at the BRCA-1 gene prior to the development of mammary tumors. This work may lead to the development of prevention strategies based on dietary compounds including those coming from grapes (resveratrol), soy (genistein), and tea (-)-epigallocatechin 3-gallate. Last year, Drs. Romagnolo and Selmin’s research team published a research paper indicating that exposure to environmental and dietary factors during pregnancy impact the risk of breast cancer in the offspring. This work provided the key observations to move forward with laboratory and animal experiments and testing of their hypotheses in human breast tumors.

## Joint Appointed Faculty Research: Dr. Cynthia Thomson

Cancer survivors are a resilient group who often win a battle, but not the war. For this reason, Dr. Thomson is devoted to researching how to improve outcomes for cancer survivors with improved diet and lifestyle behaviors through her work with the LIVES and DIME studies and the Arizona Smoker’s Helpline. In the case of ovarian cancer, there are currently no reliable screening methods, cases are often diagnosed at an advanced stage, and treatments are limited with less than optimal efficacy. Dr. Thomson’s lab is tackling this issue in the Lifestyle Intervention for Ovarian Cancer Enhanced Survival (LIVES) study with several investigators from the UA Cancer Center and MD Anderson Cancer Center in Texas. This randomized-controlled trial (RCT) is recruiting ovarian cancer survivors (n=1070) from clinics throughout the U.S. to participate for a period of 2 years. The hypothesis is that women in the intervention group will experience increased quality of life and progression-free survival (PFS). PFS is the period of time that women live post-treatment prior to cancer progression. Women are assigned to a control group, in which they receive general nutrition education, or to the intervention group where they receive multi-modal nutrition counseling via telephone, SMS, email and print to promote increased physical activity and improved diet quality. In addition to evaluating the impact on PFS, metabolic and inflammatory biomarkers will be evaluated to capture mechanistic influences on PFS. Under the supervision of NSC alum Tracy Crane, MS, RD, undergraduates and alumni from NSC and Public Health work as LIVES nutrition coaches to educate and counsel participants.



The DIME study, on which Dr. Thomson serves as PI, is a RCT evaluating whether a bioactive compound, 3,3'-diindolylmethane, which is found in cruciferous vegetables, is associated with reduced breast density, estrogen modulation or Tamoxifen metabolites in women taking Tamoxifen for breast cancer chemoprevention. Dr. Thomson’s goal as director for the Arizona Smoker’s Helpline is to expand her focus on cancer survivorship and health behaviors to include innovative approaches to promote tobacco cessation in cancer survivors.



# Graduate Program

## Congratulations!



**Danielle Vassallo** will defend her dissertation entitled, “The associations between diet quality, total and regional adiposity, and metabolic risk in Hispanic and non-Hispanic adolescent girls” and plans to graduate with her PhD degree this May. Danielle was mentored by Dr. Scott Going.

After graduation, Danielle will begin a Postdoctoral Research Assistant position at the EXOS athlete training facility in Phoenix, AZ.

**Yael Greenblatt** will defend her thesis entitled, “Optimizing nutrition education in the special supplemental nutrition program for women, infants, and children (WIC)” and plans to graduate with her MS degree this May. Yael was mentored by Dr. Melanie Hingle. After graduation, Yael will begin a dietetic internship at Banner University Medical Center.



**Melissa Wyatt** defended her thesis entitled, “Sustainable diets: Understanding nutrition educators’ perceptions” and plans to graduate with her MS degree this May. Melissa was mentored by Dr. Kay Hongu. After graduation Melissa plans to pursue a career in Cooperative Extension.

**Meghan Strom** was awarded a National Cancer Institute R25E Summer Research Experience in The University of Texas MD Anderson’s *Cancer Prevention Research Training Program* for the summer of 2015. This is a highly competitive program and we are pleased to congratulate Meghan on this accomplishment!



## Alumni Update: Kelly McGrath

**Kelly McGrath, MS, RD, CSG, LDN** completed both her undergraduate and graduate work at the UA. Her undergraduate degrees are in Physiology (Chemistry minor) and Nutritional Sciences (Dietetics option). She then completed her MS degree in Nutritional Sciences, conducting a study that investigated the influence of subjective sleep quality and quantity on weight loss outcomes in women participating in a weight loss trial, under the advisement of Dr. Cynthia Thomson.



After completing her graduate work, Kelly was accepted into the Virginia Polytechnic Institute and State University Dietetic Internship and became a Registered Dietitian. She has practiced as a Registered Dietitian for the past 5 years, achieving the Certified Specialist in Gerontology (CSG) certification, as well as the Certificate of Training in Adult Weight Management, both through the Commission on Dietetic Registration. She works at FutureCare Irvington, a long term care and skilled nursing facility, providing nutrition support for the residents of the Progressive Pulmonary Care unit. She serves as part of the interdisciplinary team treating residents who are weaning off of ventilator support as part of their rehabilitation process; and works with the long term care residents to improve their nutritional status. In this setting, she also serves as a preceptor for dietetic interns. Additionally, she teaches online nutrition courses for Anne Arundel Community College and acts as a consultant for several independent long term care and skilled nursing facilities in the Baltimore and Annapolis areas.

In her spare time, Kelly enjoys reading, cooking, visiting museums, rock climbing, and especially spending time with her family. Her educational experience at the UA was invaluable to the development of clinical, counseling and research skills that she uses in her daily practice. She is grateful for these experiences and looks forward to many more years of providing research-based nutritional care and promoting accurate nutrition knowledge for students, patients and their families.



# Undergraduates

## Danielle DePorter Invited to SLEEP Conference



NSC senior **Danielle DePorter** has been invited to deliver an oral presentation of her research at the 29<sup>th</sup> annual SLEEP joint meeting of the Sleep Research Society and American Academy of Sleep Medicine in Seattle, Washington in June 2015. Danielle's attendance at this conference is made possible by awards from the Office of the Vice President for Student Affairs and Enrollment Management and the Department of Nutritional Sciences. It is unusual for undergraduates to present at this meeting and the invitation not only highlights the significance of Danielle's research but also her promise as a young researcher.

Danielle has spent the past year working in Dr. Jennifer Teske's laboratory. Her research expands work from Dr. Teske's lab, which investigates how insufficient sleep leads to weight gain through neural and metabolic dysregulation. Poor sleep and excessive weight gain are common in society. This relationship between lack of sleep and weight gain may be related to changes that occur in the brain after one has experienced sleep deprivation. Orexin-A is a chemical naturally produced in the brain, which controls and increases the amount of time one spends awake, asleep or being physically active. Dani's research demonstrates that after acute and chronic sleep deprivation, orexin-A failed to increase arousal, physical activity or the energy expenditure caused by physical activity. This suggests that acute and chronic sleep deprivation alters the brain's ability to respond to orexin-A and that weight gain after sleep deprivation may arise due to fewer opportunities to increase physical activity and lower intrinsic motivation to perform physical activity.

Danielle graduates with her Bachelor of Science degree in Nutrition this May and will enter the Graduate Program in Nutritional Sciences this fall to begin work on a Master's Degree while continuing her research in the Teske lab. *Congratulations Danielle!*

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## Cassandra Sieg Learns About Mycology



The University of Arizona has a number of labs that are being run all over campus, but one that you may not suspect is the lab run by MycoCats. MycoCats is a project started by Plant Sciences Professor Dr. Barry Pryor to study mycology and cultivate mushrooms. Mycology is the study of fungi, including their biology, ecology, and impact on humans and human affairs. The lab uses post-consumer waste like pizza boxes and coffee grounds to grow gourmet mushrooms — including white oyster, blue oyster and shiitakes.

The mushrooms produced in these labs don't just stay in the lab for research; in fact a majority of them are utilized by UA Dining Services and donated to the Community Food Bank. So if you've eaten a meal on campus that had mushrooms in it there is a good chance you are eating something produced by MycoCats! MycoCats also works closely with other groups interested in sustainability like UA Compost Cats, LEAF, and Desert Harvesters.

Besides gaining recognition for their antioxidant activity, antibacterial properties, and historical medicinal qualities, mushrooms also boast a high nutritional value. The protein content in mushrooms is high and the array of vitamins and minerals they provide are very exciting to see, especially to those interested in nutrition like myself. I work with MycoCats weekly as part of the NSC 395A: *Experiential Learning in Nutritional Sciences* course, and have learned a great deal as a result. I've experienced the scientific side, the business aspects, learned lab techniques, and seen how the push for sustainability has fostered community involvement. Being able to do hands-on work is ideal for me, and in the lab there was a ton of that. There were many rooms to explore and techniques to learn that provided me with a lot of invaluable lab experiences.

For more information on MycoCats visit:  
<http://cals.arizona.edu/mycocats>.

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# Outreach

## UANN Leads Students in Youth Yoga Classes



As part of a comprehensive obesity prevention approach reaching Supplemental Nutrition Assistance Program Education (SNAP-Ed) eligible youth, the University of Arizona Nutrition Network (UANN) is offering yoga demonstration programs at participating high schools.

Program Coordinator Hayley Moretz, a certified yoga instructor, began piloting the program at Flowing Wells High School in October of 2014 through close collaboration with PE teacher Terri Swaney. Yoga supports the 2008 Physical Activity Guidelines for Americans' recommendations by providing physical activity that incorporates aerobic, muscle and bone-strengthening movement.

The yoga program is typically taught after a nutrition education lesson. Each of the four 30 minute sessions progressively increase in intensity and skill to provide students with a complete introduction to basic yoga. The series allows all

students, including those with initial hesitations, to have time to feel comfortable and explore the physical and mental benefits of a yoga practice; such as flexibility, strength, and stress relief.

The success of the pilot program has increased demand by teachers for student yoga at Flowing Wells High School, including in the Independent Living Skills (ILS) Special Education classroom. Hayley provides an adapted series of yoga classes to accommodate students with limited mobility. The UANN will continue to develop programming for SNAP-Ed eligible youth to address the need for increased physical activity in schools that is age-appropriate and enjoyable.

The Co-Principal Investigators for the UANN Pima County campus unit are Dr. Vanessa Farrell and Dr. Laurel Jacobs, and the Principal Investigator is Dr. Scottie Misner.

Contributed by UANN Program Coordinator Lauren McCullough, MPH: [laurenmccullough@email.arizona.edu](mailto:laurenmccullough@email.arizona.edu)

## Alyssa Los Works with LEAF to Harvest Food on Campus

There are approximately 1,800 plants on the University of Arizona campus that produce edible fruit, nuts and pods. In recent years, these trees have been harvested by volunteers and interns working with the UA chapter of *Linking Edible Arizona Forests* (LEAF). UA LEAF is closely affiliated with the statewide LEAF, which aims to connect people to the edible foods in their surroundings. Post-harvest, UA LEAF provides food to organizations like the UA Campus Food Pantry, UA Dining Services and the Iskashitaa Refugee Network, a group here in Tucson that has been gleaned food from local trees and farms for more than a decade. Iskashitaa has helped our organization with harvesting tools and tips, and in return we provide them with fruit from many of our harvests. We also partner with the UA Green Fund, the Department of Soil, Water and Environmental Science and the Campus Arboretum.

I found out about LEAF through the Nutrition class NSC395A: *Experiential Learning*, where students intern with an organization. The description instantly caught my eye as I was unaware of who utilized the edible trees on campus and wanted to learn more. Soon after the class ended I was hired as a full time intern. My responsibilities at LEAF include helping to organize the harvests and other events,

such as Food Day and the Tucson Festival of Books to attract more attention to our organization. I have also helped create recipe cards and harvesting tips so others can utilize their own trees at home and make recipes to create a more sustainable world.

The main reason I decided to become a Nutritional Science major was because I love helping others, especially in the area of food insecurity. I have also always had a passion for environmental science. Now, through LEAF, I am able to combine my two favorite subjects. I am so grateful to have a job that allows me to help the environment and those in the community who are food insecure at the same time. Be sure to check out our Facebook profile [www.facebook.com/UALEAF](http://www.facebook.com/UALEAF) or email me if you are interested in joining us for a harvest!



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# Extension

## Walk Across Arizona 2015 Update



Walk Across Arizona (WAAZ) is a statewide community walking program through the University of Arizona Cooperative Extension. In the spring of 2015, a total of 1,346 people from Maricopa, Navajo, Pima, and Yavapai counties registered in the WAAZ program. This year students in the Department of Nutritional Sciences, Physiology, and Public Health wrote weekly newsletters with help of Nancy Rogers, MS, RDN, CWWS, Coordinator of Employee Wellness and Health Promotion at UA Life & Work Connections. These newsletters are

featured on the popular WAAZ website (<http://cals.arizona.edu/walkacrossaz>); which recorded more than 54,000 pageviews during March and April, 2015. This year's topic, *Healthy Lifestyles in the Kitchen*, focused on meal planning, grocery shopping and cooking.

"Walks with Campus Leaders" is a program provided by UA Life & Work Connections. This program brings together UA employees, students and WAAZ participants to connect with each other and campus leaders while enjoying interesting 20-25 minute walks around campus. On April 1, the campus community had the opportunity to walk with Dr. Ann Weaver Hart, UA President. The last walk of the semester is May 6 with Dr. Skip Garcia, Senior VP Health Sciences, Professor, Medicine. To attend, meet at noon on the Medical Plaza just outside the doors to the College of Medicine. See [http://lifework.arizona.edu/wsw/walks\\_with\\_campus\\_leaders](http://lifework.arizona.edu/wsw/walks_with_campus_leaders) for further information.



## SHAPE Award



**Jennifer Reeves, MEd**, Associate Research Scientist in the Department of Nutritional Sciences, was selected by SHAPE America (The Society of Health and Physical Educators) to receive the *Joy of Effort Award* at the 2015 National Convention in Seattle, Washington. "The Joy of Effort is

given in recognition of those individuals who, by performance and style, have personified the concept that the effort made to enrich the goals and objectives of physical education and sport is a labor of love, inspired by commitment and dedication," says SHAPE America President Dolly Lambdin.

At the state level, Reeves is a key member of the Arizona State Coordinated School Health Leadership Team and the Arizona Department of Health Services Public Health Action Program; serving 80 schools in 9 districts. She is Co-Chairperson for the Arizona Action for Healthy Kids Program and Arizona Alliance for a Healthy Generation Intermediary to promote the Healthy Schools Program throughout Arizona. At the national level, Reeves is a trainer for the three initiatives of the Comprehensive School Physical Activity Program and serves as a content expert for the NASPE/CDC Comprehensive Physical Activity Program national writing team that published *Comprehensive School Physical Activity Programs: A Guide for Schools* in 2013.

## Support Nutritional Sciences

Supporting the Department of Nutritional Sciences has never been easier! All contributions are made to the UA Foundation, a 501(c)3 organization. Through this foundation donors may choose how their gift is applied. All gifts are tax deductible. Visit <http://cals.arizona.edu/nutrition/content/donations> for direct links to the UA Foundation for secure, online giving.



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NUTRITIONAL SCIENCES

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